

## MATHEMATICAL REASONING

The following six California mathematics academic content standards from the Mathematical Reasoning strand are assessed on the CAHSEE by 8 test questions and are represented in this booklet by 17 released test questions. These questions represent only a few of the ways in which these standards may be assessed on the CAHSEE.

NOTE: Each question in this strand also addresses a standard in one of the other five strands and is classified by that strand for purposes of reporting student scores. For example, the first question in the following set is classified as 7MR1.1 and also 7MG1.3.

GRADE 7 — MATHEMATICAL REASONING	
<b>Standard Set 1.0</b>	<b>Students make decisions about how to approach problems:</b>
1.1	Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.
1.2	Formulate and justify mathematical conjectures based on a general description of the mathematical question or problem posed.
<b>Standard Set 2.0</b>	<b>Students use strategies, skills, and concepts in finding solutions:</b>
2.1	Use estimation to verify the reasonableness of calculated results.
2.3	Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.
2.4	Make and test conjectures by using both inductive and deductive reasoning.
<b>Standard Set 3.0</b>	<b>Students determine a solution is complete and move beyond a particular problem by generalizing to other situations:</b>
3.3	Develop generalizations of the results obtained and the strategies used and apply them to new problem situations.

**Mathematical Reasoning**

- 118. Chris drove 100 kilometers from San Francisco to Santa Cruz in 2 hours and 30 minutes. What computation will give Chris' average speed, in kilometers per hour?**

A Divide 100 by 2.5.  
 B Divide 100 by 2.3.  
 C Multiply 100 by 2.5.  
 D Multiply 100 by 2.3.

M03164

A flower shop delivery van traveled these distances during one week: 104.4, 117.8, 92.3, 168.7, and 225.6 miles. How many gallons of gas were used by the delivery van during this week?

- 119. What other information is needed in order to solve this problem?**

A The average speed traveled in miles per hour  
 B The cost of gasoline per gallon  
 C The average number of miles per gallon for the van  
 D The number of different deliveries the van made

M00138

- 120. If  $n$  is any odd number, which of the following is true about  $n + 1$ ?**

A It is an odd number.  
 B It is an even number.  
 C It is a prime number.  
 D It is the same number as  $n - 1$ .

M00155

- 121. The table below shows the flight times from San Francisco (S.F.) to New York (N.Y.).**

Leave S.F. Time	Arrive N.Y. Time
8:30 A.M.	4:50 P.M.
12:00 noon	8:25 P.M.
3:30 P.M.	11:40 P.M.
9:45 P.M.	5:50 A.M.

**Which flight takes the longest?**

A The flight leaving at 8:30 A.M.  
 B The flight leaving at 12:00 noon  
 C The flight leaving at 3:30 P.M.  
 D The flight leaving at 9:45 P.M.

M00376

- 122. If  $a$  is a positive number and  $b$  is a negative number, which expression is always positive?**

A  $a - b$   
 B  $a + b$   
 C  $a \times b$   
 D  $a \div b$

M10683

**Mathematical Reasoning**

123. The table below shows the number of visitors to a natural history museum during a 4-day period.

Day	Number of Visitors
Friday	597
Saturday	1115
Sunday	1346
Monday	365

Which expression would give the BEST estimate of the total number of visitors during this period?

- A  $500 + 1100 + 1300 + 300$   
 B  $600 + 1100 + 1300 + 300$   
 C  $600 + 1100 + 1300 + 400$   
 D  $600 + 1100 + 1400 + 400$

M11112

124. Which is the best estimate of  $326 \times 279$ ?

- A 900  
 B 9,000  
 C 90,000  
 D 900,000

M00277

125. Marcus plans to buy a CD that has a regular price of \$13.99. It is on sale for 10% off, but Marcus will have to pay 7% sales tax. Which is the MOST reasonable estimate of the total cost of the CD including tax?

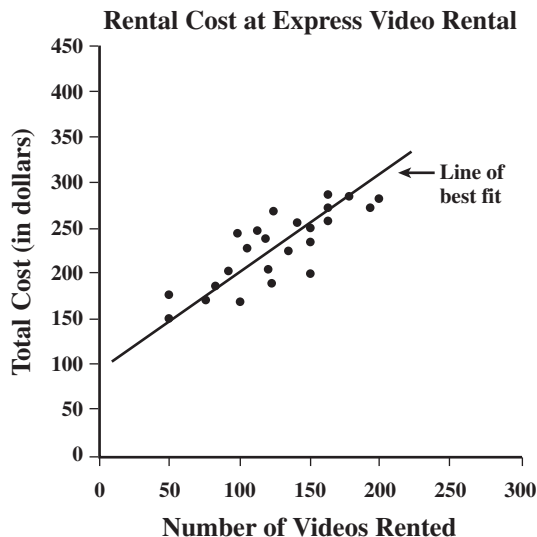
- A \$12.50  
 B \$13.50  
 C \$14.50  
 D \$15.50

M11869

126. The temperature on a mountain peak was 7 degrees Fahrenheit ( $^{\circ}\text{F}$ ) at 6:00 p.m. By 8:00 p.m., the temperature had dropped to  $0^{\circ}\text{F}$ . If the temperature continued to drop at about the same rate, which is the BEST estimate of the temperature at 11:00 p.m.?

- A  $-20^{\circ}\text{F}$   
 B  $-14^{\circ}\text{F}$   
 C  $-10^{\circ}\text{F}$   
 D  $-9^{\circ}\text{F}$

M20451



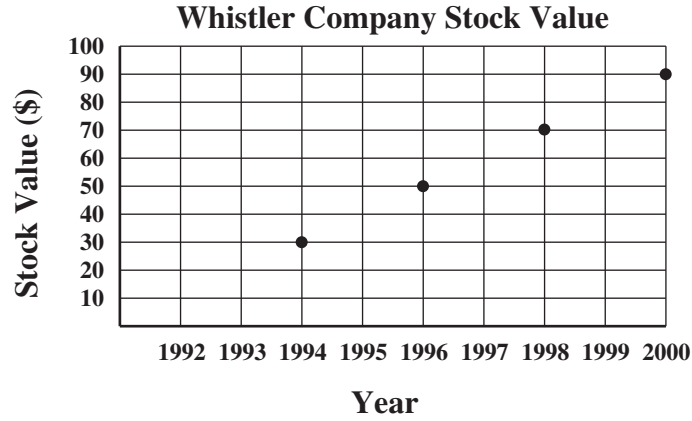
127. Using the line of best fit shown on the scatterplot above, which of the following best approximates the rental cost per video to rent 300 videos?

- A \$3.00  
 B \$2.50  
 C \$2.00  
 D \$1.50

M02209

**Mathematical Reasoning**

128. The graph below shows the value of Whistler Company stock at the end of every other year from 1994 to 2000.



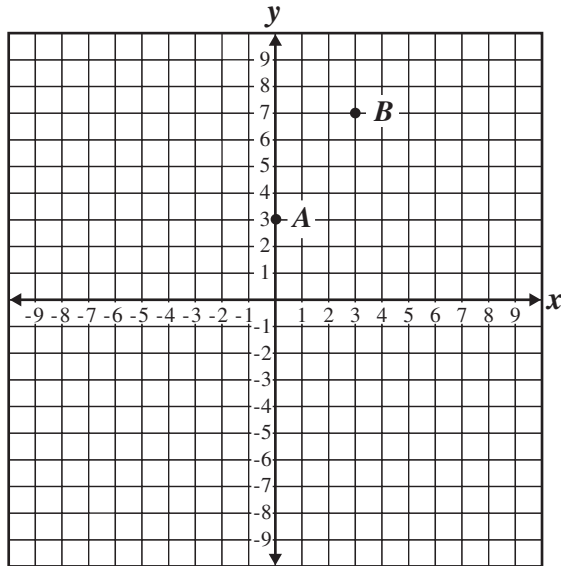
From this graph, which of the following was the most probable value of Whistler Company stock at the end of 1992?

- A    -\$10
- B    \$1
- C    \$10
- D    \$20

M02898

**Mathematical Reasoning**

129. If a line passes through the points *A* and *B* shown below, approximately where does the line cross the *x*-axis?



- A between  $-3$  and  $-2$   
 B between  $0$  and  $-1$   
 C between  $0$  and  $1$   
 D between  $1$  and  $2$

M10702

130. The table below shows values for *x* and corresponding values for *y*.

<i>x</i>	<i>y</i>
21	3
14	2
28	4
7	1

Which of the following represents the relationship between *x* and *y*?

- A  $y = \frac{1}{7}x$   
 B  $y = 7x$   
 C  $y = x - 6$   
 D  $y = x - 18$

M00377

131. The winning number in a contest was less than 50. It was a multiple of 3, 5, and 6. What was the number?

- A 14  
 B 15  
 C 30  
 D It cannot be determined.

M00393

**Mathematical Reasoning**

132. Lia used the following process to find the slope of the line described by the equation  $3y + 5x = 12$ .

Step 1: Subtract $5x$ from each side.	$3y = -5x + 12$
Step 2: Divide each side by 3.	$y = -\frac{5}{3}x + 4$
Step 3: The slope of $y = mx + b$ is $m$ .	Slope is $-\frac{5}{3}$

According to Lia's method, which expression gives the slope of the line described by the equation  $ax + by = c$ ?

- A  $-\frac{a}{b}$
- B  $\frac{a}{b}$
- C  $-\frac{b}{a}$
- D  $\frac{b}{a}$

M11892

Len runs a mile in 8 minutes. At this rate how long will it take him to run a 26-mile marathon?

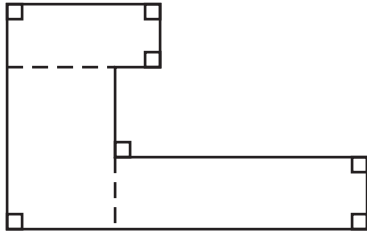
133. Which of the following problems can be solved using the same arithmetic operations that are used to solve the problem above?

- A Len runs 26 miles in 220 minutes. How long does it take him to run each mile?
- B A librarian has 356 books to place on 18 shelves. Each shelf will contain the same number of books. How many books can the librarian place on each shelf?
- C A cracker box weighs 200 grams. What is the weight of 100 boxes?
- D Each basket of strawberries weighs 60 grams. How many baskets can be filled from 500 grams of strawberries?

M00137

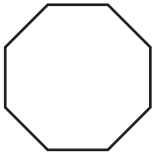
**Mathematical Reasoning**

134. Mia found the area of this shape by dividing it into rectangles as shown.

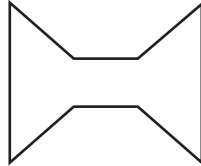


Mia could use the same method to find the area for which of these shapes?

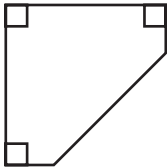
A



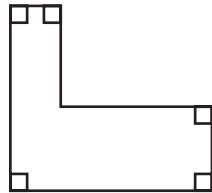
C



B



D



M25128

***Mathematical Reasoning***

Question Number	Correct Answer	Standard 1	Standard 2	School Year of Exam
118	A	7MR1.1	7MG1.3	2001-2002
119	C	7MR1.1	7NS1.2	2000-2001
120	B	7MR1.2	7AF1.1	2001-2002
121	B	7MR1.2	7MG1.1	2000-2001
122	A	7MR1.2	7AF1.1	2003-2004
123	C	7MR2.1	7NS1.2	2002-2003
124	C	7MR2.1	7NS1.2	2000-2001
125	B	7MR2.1	7NS1.3	2003-2004
126	C	7MR2.1	7AF4.2	2004-2005
127	D	7MR2.3	7PS1.2	2001-2002
128	C	7MR2.3	7AF1.5	2000-2001
129	A	7MR2.3	7AF3.3	2004-2005
130	A	7MR2.4	7AF1.1	2002-2003
131	C	7MR2.4	7NS1.2	2000-2001
132	A	7MR3.3	7AF4.1	2002-2003
133	C	7MR3.3	7NS1.2	2001-2002
134	D	7MR3.3	7MG2.2	2004-2005